

Severe Weather Safety Awareness: Standard Operating Procedures for Families



Credit: Associated Press

NIST- ITL July 12, 2007

Top 6 Weather Myths

- Lightning never strikes twice in the same place
- Rain drops are shaped like tear drops
- Open all windows before a tornado strikes
- The tires on your car insulate you from lightning strikes
- Summer officially begins on June 21st in the N. Hemisphere
- TV weathercasters are always wrong

Some questions to answer:

What is "Severe Weather" ?

Where does it occur?

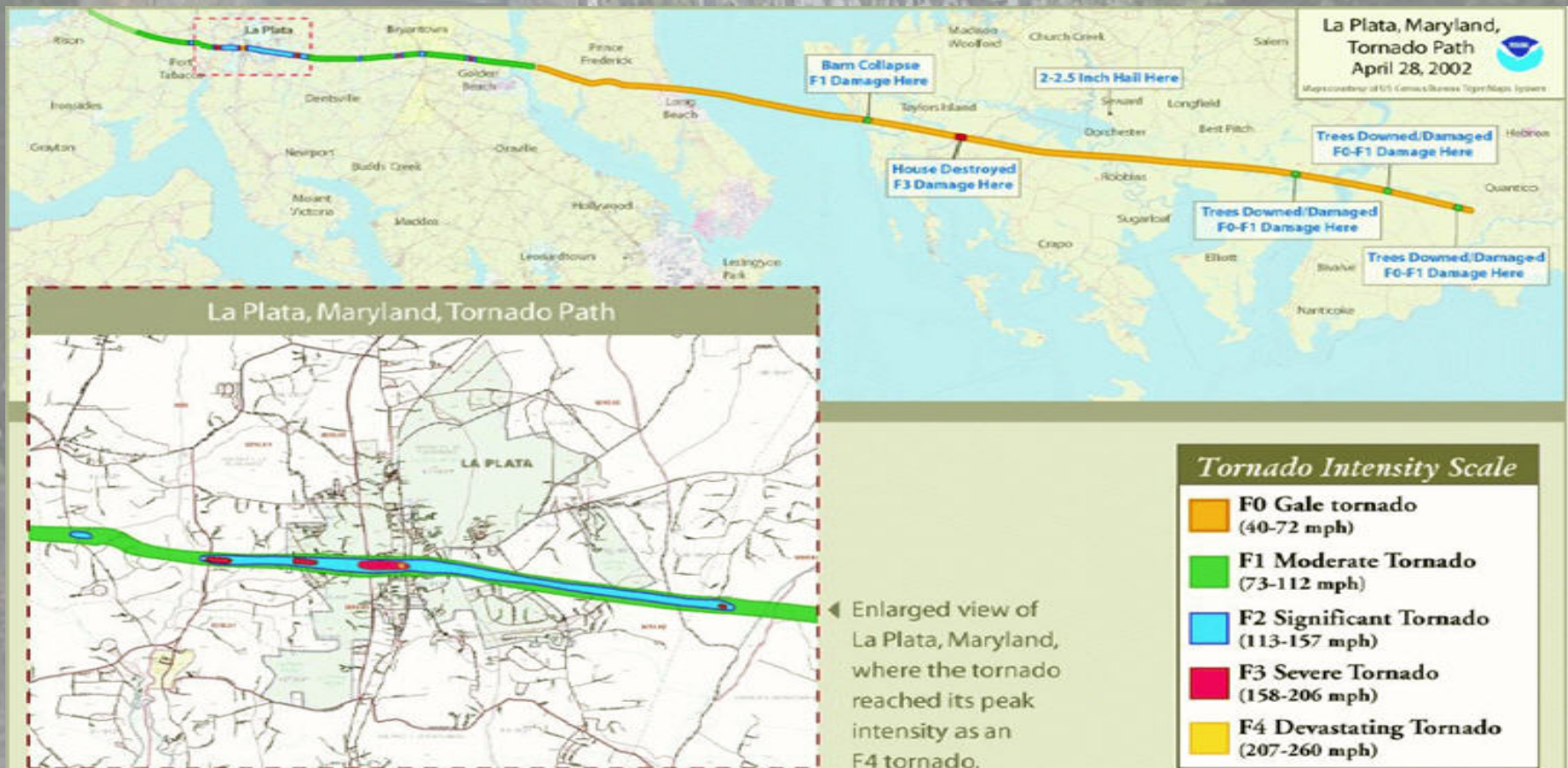
When is it most likely to occur?

Why should you care?



Useful information:

- Definitions and Statistics
- Planning Tools
- What to do? What not to do?



U.S. Average Yearly Deaths From Severe Weather Events

Hurricanes
Tornadoes
Lightning
Flash Flooding
Heat Stress



U.S. Average Yearly Deaths From Severe Weather Events

Hurricanes	(16)
Tornadoes	(65)
Lightning	(73)
Flash Flooding	(127)
Heat Stress	(175)

A Severe Thunderstorm has:

-Winds of at least 50 knots/58 mph

And/or a tornado

-And/or Hail of at least $\frac{3}{4}$ inch diameter



What is a tornado?

"a violently rotating column of air, pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a funnel cloud."

(AMS Glossary of Meteorology-2002)

Literally, in order for a vortex to be classified as a tornado, it must be in contact with the ground *and* the cloud base.



Where and when do tornadoes & severe weather occur?

-La Plata, Maryland April 28, 2002
Dale City, Virginia

-College Park Maryland Sept. 24, 2001
Rixeyville, Virginia



Fujita Tornado Damage Scale

Developed in 1971 by T. Theodore Fujita of the University of Chicago

SCALE	WIND ESTIMATE *** (MPH)	TYPICAL DAMAGE
F0	< 73	<u>Light damage</u> . Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	<u>Moderate damage</u> . Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	<u>Considerable damage</u> . Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	<u>Severe damage</u> . Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	<u>Devastating damage</u> . Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318	<u>Incredible damage</u> . Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

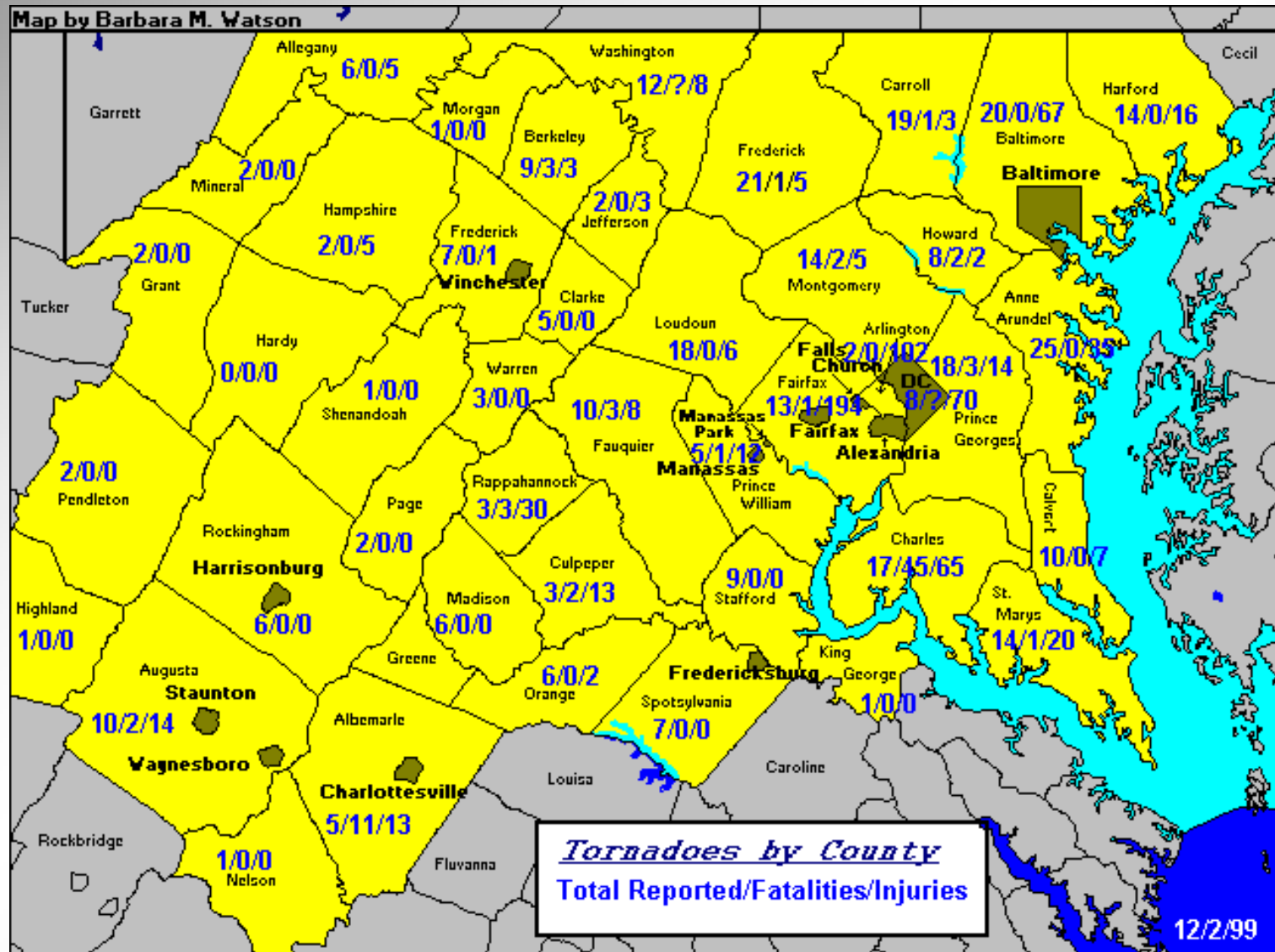
*** **IMPORTANT NOTE ABOUT F-SCALE WINDS:** Do not use F-scale winds literally. These precise wind speed numbers are actually guesses and have never been scientifically verified. Different wind speeds may cause similar-looking damage from place to place -- even from building to building. *Without a thorough engineering analysis of tornado damage in any event, the actual wind speeds needed to cause that damage are unknown.*

Tornado Statistics for the LWX area

Tornado Summary Table by County: (ALL tornadoes on record through 6/7/01)

MD Counties	Total #	#F0/ F1	#F2/ F3	#F4/ F5	Deaths	Injuries	Damages (M)
Allegany	7	4	2	1	0	5	\$ 5.227
Anne Arundel	27	20	7	0	0	36	\$ 1.997
Baltimore	23	16	7	0	0	67	\$ 12.613
Calvert	13	9	4	0	0	8	\$ 1.105
Carroll	19	10	9	0	0	3	\$ 6.165
Charles	20	15	4	1	45	52+	\$ 1.105
Frederick	22	18	4	0	2	7	\$ 1.592
Harford	16	13	3	0	0	16	\$ 1.511
Howard	8	5	3	0	0	2+	\$ 1.193
Montgomery	18	15	3	0	4	25	\$ 1.383
Prince Georges	21	13	8	0	3	10+	\$ 12.460
St. Marys	16	13	3	0	1+	24+	\$ 0.884
Washington	12	9	3	0	0	8+	\$ 1.438
MD Total	212	157	53	2	55+	268+	\$48.593

Tornado Statistics by County



When is severe weather most likely to affect you?


- When you are at work.
- When the kids are at school or sporting events.



What is a parent to do?

1. Stay “Weather involved”.
2. Have a family plan.
3. Stay calm.
4. Take appropriate action.


1. Stay tuned to the media
2. Listen to NOAA Weather radio
3. Learn to be a forecaster.



National Weather Service

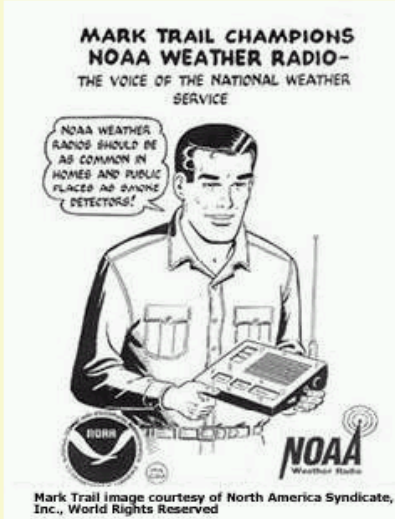
NOAA Weather Radio

www.nws.noaa.gov



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MARK TRAIL CHAMPIONS
NOAA WEATHER RADIO-
THE VOICE OF THE NATIONAL WEATHER SERVICE

NOAA WEATHER RADIO SHOULD BE AS COMMON IN HOMES AND PUBLIC PLACES AS SMOKE DETECTORS!

Mark Trail image courtesy of North America Syndicate, Inc., World Rights Reserved

NOAA Weather Radio (NWR) is a nationwide network of radio stations broadcasting continuous weather information direct from a nearby [National Weather Service office](#). NWR broadcasts National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day.

Working with the [Federal Communication Commission's \(FCC\) Emergency Alert System](#), NWR is an "all hazards" radio network, making it your single source for comprehensive weather and emergency information. NWR also broadcasts warning and post-event information for all types of hazards--both natural (such as earthquakes and volcano activity) and environmental (such as chemical releases or oil spills).

Known as the "Voice of NOAA's National Weather Service," NWR is provided as a public service by the [National Oceanic & Atmospheric Administration \(NOAA\)](#), part of the Department of Commerce. NWR includes more than **850 transmitters**, covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. NWR requires a [special radio receiver](#) or scanner capable of picking up the signal. Broadcasts are found in the public service band at these seven frequencies (MHz):

162.400	162.425	162.450	162.475	162.500	162.525	162.550
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The best NOAA Weather Radios for Severe Weather Notification:

- have Specific Area Message Encoder (SAME) feature,
- are battery powered,
- cover 7 channels.

<http://www.nws.noaa.gov/nwr>

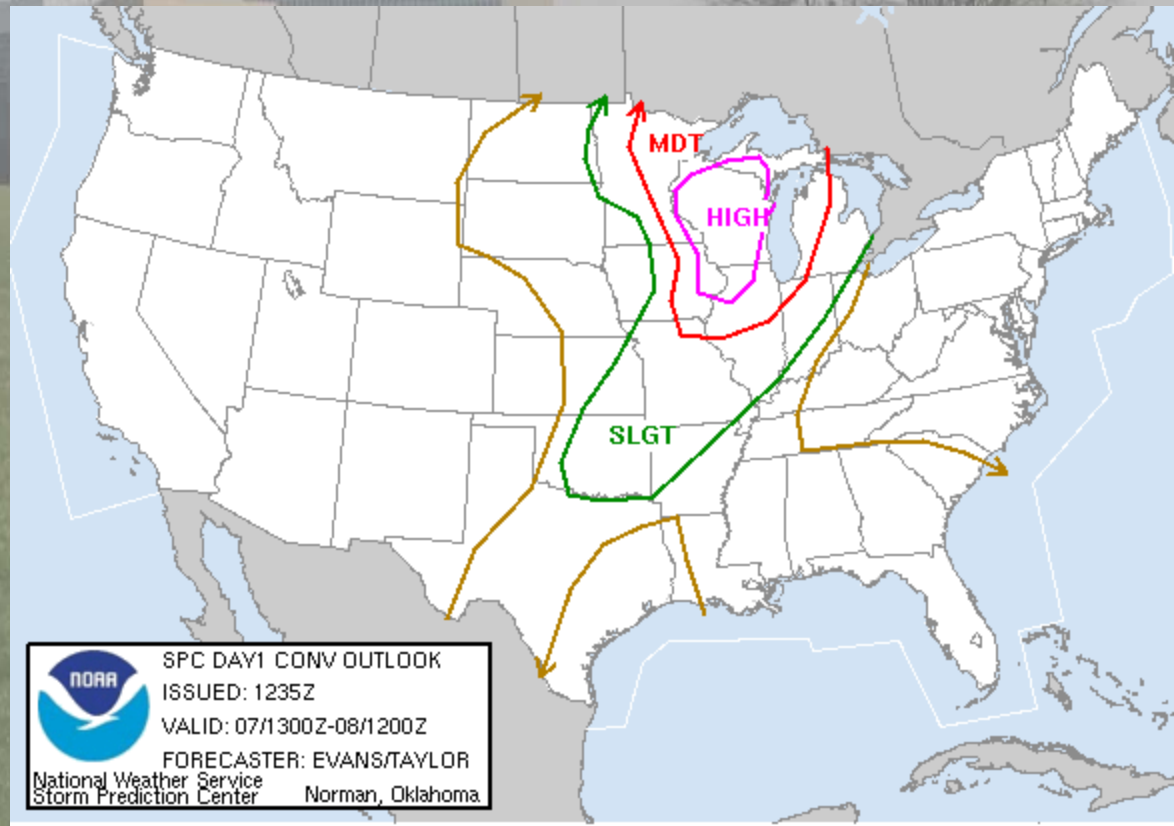


*Does your local school/camp have a
severe weather emergency plan?*

<http://www.erh.noaa.gov/er/lwx/swep/>

Get Ready; Get Set; Go.

- AM Convective Outlook
- Severe Thunderstorm Watch
- Severe Thunderstorm Warning



A Severe Thunderstorm/ Tornado Watch means:

-severe weather is possible where you are in the next couple of hours.



-A Severe Thunderstorm/Tornado Warning means severe weather has been spotted and is occurring or imminent...Take action.





What not to do!

- Open all the windows.
- Get in your car and drive home ASAP.
- Find your video cam and set it up outside to tape the tornado.
- Call all your friends to see if the tornado has hit their house.
- Finish the last load of laundry.
- Start the dishwasher.
- Check the baseball scores on your laptop

HOWARD COUNTY

Laptop User Slightly Hurt as Power Surge Jolts House

By MARY OTTO
Washington Post Staff Writer

It was Wednesday afternoon, and Martin Fischer, an Ellicott City sales representative, decided to log on and finish a little work before celebrating the Fourth of July holiday with his family. Thunderstorms were moving through the area, so the picnic plans were on hold.

He went to the basement. The battery on his laptop computer was running low, so he plugged it in. He settled down with the computer on his knees.

Then, normalcy exploded. A surge of power shot through his legs.

"It really jolted me," he recalled. Upstairs, a flash of light made his wife scream.

Everyone was shaken. The family,

"We just heard a couple of rumbles, and then it just hit. It was a bizarre incident."

Martin Fischer, laptop computer user

worried that lightning had struck the house, called 911.

A fire-and-rescue team that arrived at the brick colonial on Walt Mill Court about 5:15 p.m. could find no evidence of a lightning strike and no trace of fire, said William Mould, a spokesman for the Howard County Fire and Rescue Department.

The rescue workers concluded that the house had been hit by a power surge.

"We believe it was because of the storm," Mould said. "I can't say he was struck by lightning."

According to the National Weather Service's Web site, "In addition to direct strikes, lightning generates electrical surges that can damage electronic equipment some distance from the actual strike."

Rescue workers treated Fischer, Mould said.

"He suffered some minor burns to his legs and asked to be evaluated," Mould said. An electrocardiogram ruled out lasting damage, he said.

Fischer said that the family usually turns off electrical appliances and takes other precautions during storms

but that in this case, the weather did not seem imminently threatening.

"We just heard a couple of rumbles and then it just hit," he said. "It was a bizarre incident."

Sarah Rogowski, a spokeswoman for the National Weather Service, said a severe thunderstorm warning had been in effect for Howard County from 4:30 to 5:15 p.m. Wednesday.

The Weather Service urges people to go indoors during storms but also cautions them to take precautions while inside, such as avoiding contact with corded phones, electrical equipment and plumbing.

Fischer, who said the welts on his legs had subsided by about 10 that night, considers himself lucky that he emerged largely unscathed.

"I think it was just a big scare," he said.

Lightning Flash= 10,000-200,000 amps and
1 billion volts

All thunderstorms have lightning:



Lightning Safety:

- If you hear thunder, lightning from a storm is close enough to strike you.
- Go inside.

Lightning Safety:



- Turn OFF/unplug your computer.
- Stay off the phone.

Flash Flood Safety:



Turn Around; Don't drown

<http://www.nws.noaa.gov/om/brochures/flood/>

Heat Stress Safety

- Drink plenty of non alcoholic liquids
- Minimize exposure (11 am-4 pm)
- Wear loose fitting clothing
- Wear sun screen lotion when outside
- Watch for signs of heat exhaustion (Dizziness, head aches, cramps, pale skin
- Move victim to a cooler environment
- Loosen outer clothes
- Wet the skin. Call 911.



Learn more....

Severe weather Spotters Guide

http://www.nws.noaa.gov/om/brochures/adv_spotters.pdf

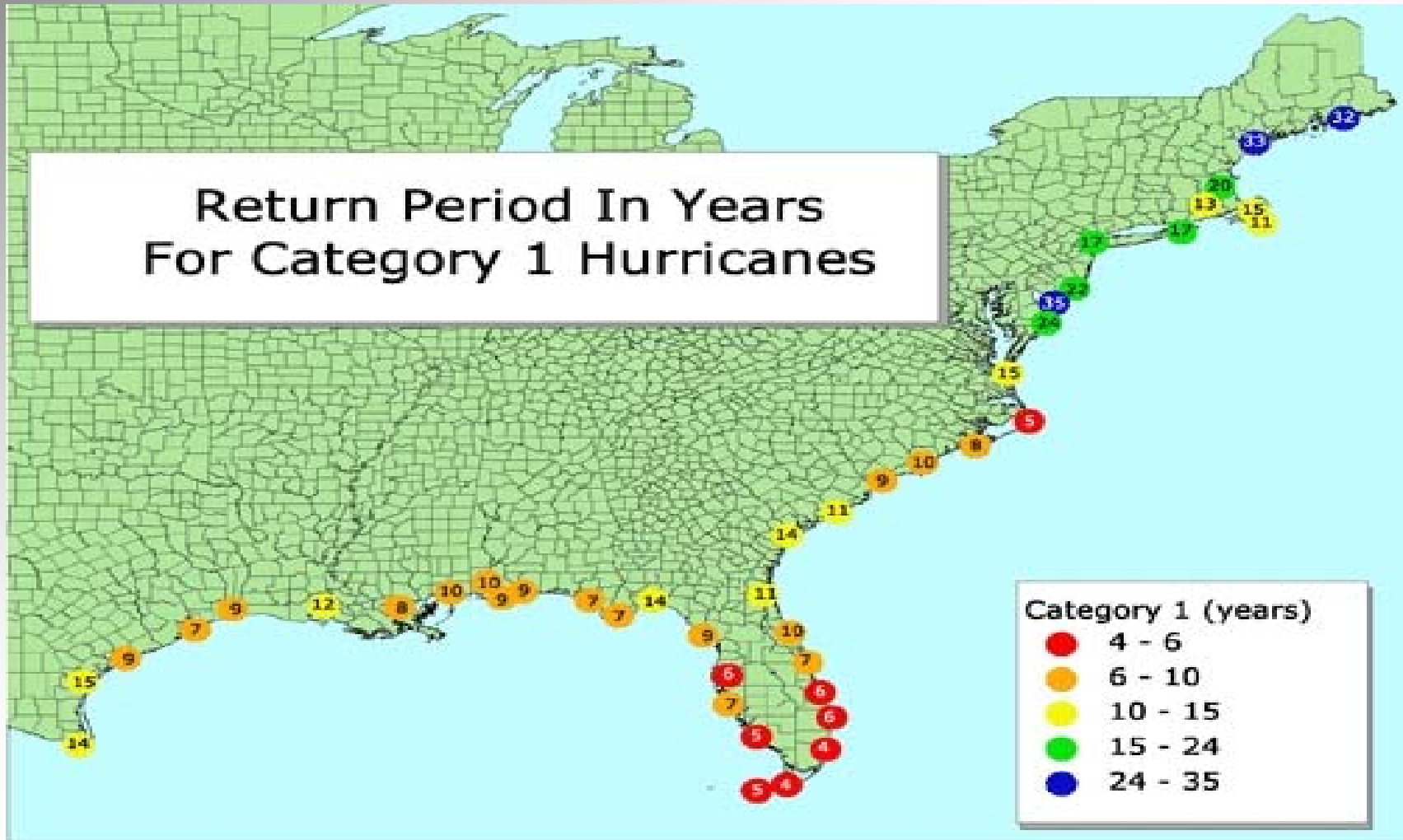
Tornado FAQ

<http://www.spc.noaa.gov/faq/tornado>

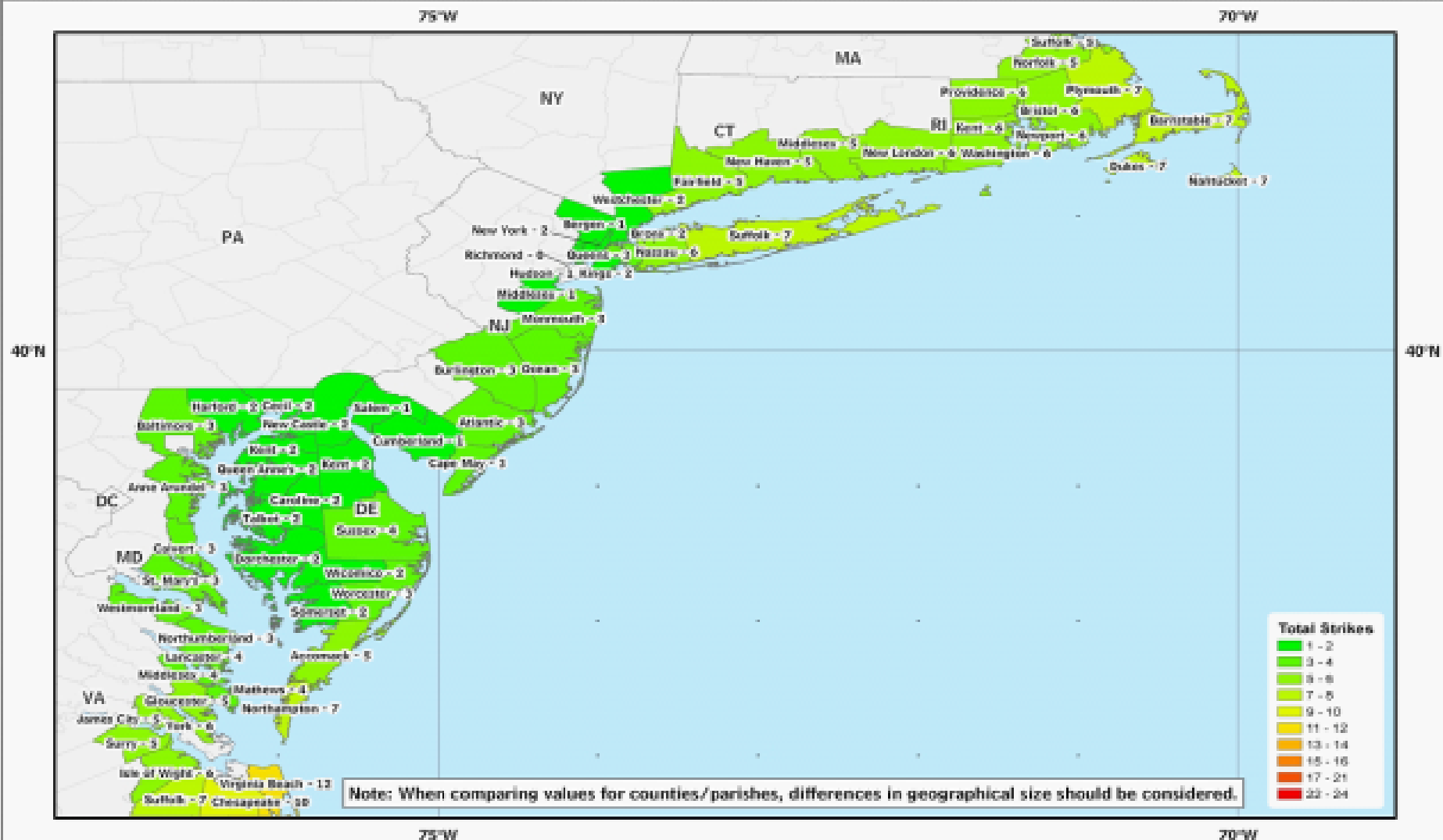
Meteorology On line Weather Course

<http://nimbus.met.tamu.edu/class/wflm/>

Hurricane Strike Return Periods



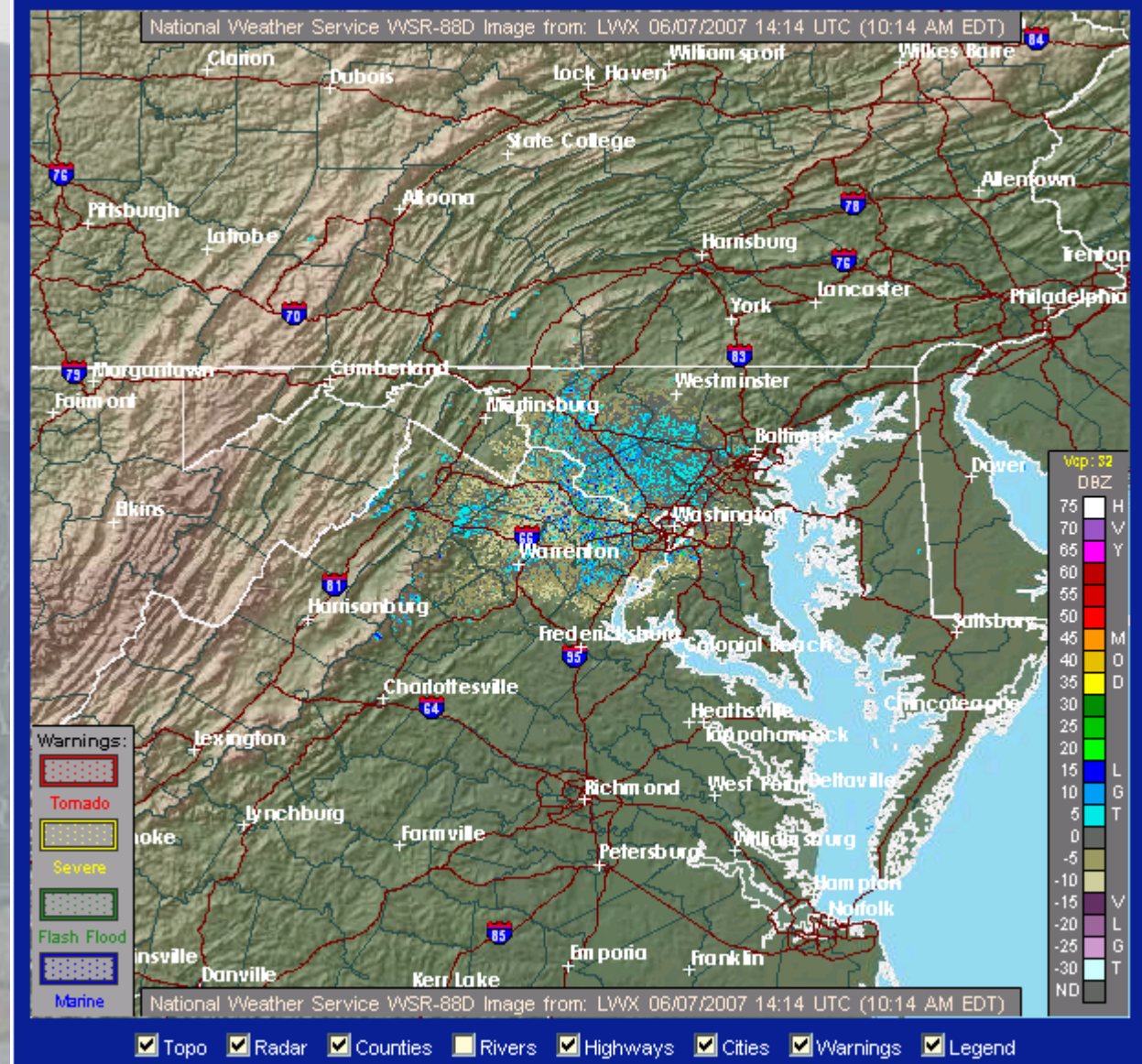
Hurricane Strikes by County



Total number of hurricane strikes by counties/parishes, 1926-2005

Data from NWS NHC 44: Hurricane Experience Levels of Coastal County Populations from Texas to Maine, Jerry D. Jarrell, Paul J. Roberts, and Max Hayfield, August, 1992, with updates.

On Line Radar Imagery



<http://www.erh.noaa.gov/radar/latest/DS.p19r0/si.klwx.shtml>

Tornado Statistics for the LWX area

Tornado Summary Table by County: (ALL tornadoes on record through 6/7/01)

VA Counties	Total #	#F0/ F1	#F2/ F3	#F4/ F5	Deaths	Injuries	Damages (M)
Albemarle	8	4	4	0	11	15	\$ 0.825 +
Arlington/Alexandria	2	1	1	0	0	12	\$ 0.325
Augusta	10	5	5	0	2	14	\$ 3.00 +
Clarke	6	5	1	0	0	0	\$ 0.165
Culpeper	3	0	3	0	2	13	\$ 0.150 + ?
Fairfax	13	6	7	0	1	194	\$ 21.60
Fauquier	10	8	2	0	3	8+	\$ 0.175
Frederick	7	5	2	0	0	1	\$ 0.085
Greene	4	2	2	0	1	9	\$ 1.00 + ?
Highland	1	1	0	0	0	0	\$ 0.00 + ?
King George	1	0	1	0	0	0	\$ 0.080
Loudoun	18	14	4	0	0	6	\$ 0.200
Madison	7	6	1	0	0	0	\$ 0.152
Nelson	1	1	0	0	0	0	\$ 0.008
Orange	6	4	2	0	0	2	\$ 0.350
Page	4	2	2	0	0	0	\$ 0.135
Prince William	6	3	3	0	1	12	\$ 0.335
Rappahannock	3	1	2	0	3	30	\$ 0.150

Tornado Statistics for the LWX area

Tornado Summary Table by County: (ALL tornadoes on record through 6/7/01)

WV Counties	Total #	#F0/ F1	#F2/ F3	#F4/ F5	Deaths	Injuries	Damages (M)
Berkeley	9	6	3	0	3	3	\$ 0.385
Grant	2	2	0	0	0	0	\$ 0.015
Hardy	0	0	0	0	0	0	\$ 0.00
Hampshire	2	2	0	0	0	5	\$ 0.125
Jefferson	2	1	1	0	0	3	\$ 0.100
Mineral	2	1	1	0	0	0	\$ 0.150
Morgan	1	1	0	0	0	0	\$ 0.00
Pendleton	2	2	0	0	0	0	\$ 0.008
WV Total	18	13	5	0	3	11	\$0.783 M

What to do to maximize your safety:

- Plan for the daily impact on your family.
- Keep your emergency kit ready.